AMENDMENT RESPONSIVE TO OFFICE ACTION

IN THE SPECIFICATIION

Applicant amends the Specification as follows:

On page 6 line 6 change "integrated" to "integrator".

On page 6 line 8 change "quantifier" to "quantizer".

IN THE CLAIMS

Please cancel claims 9 and 10 without prejudice.

REMARKS

The specification was objected to for informalities. Applicant requests reconsideration. The specification has been accordingly amended. The claims 9 and 10 were rejected as indefinite. The claims 9 and 10 have been canceled without prejudice.

Claim 1 and 8 were rejected as unpatentable over Beauducel in view of Palmer. Claims 2-4 and 11 were rejected as unpatentable over Beauducel in view of Palmer in view of Potratz. Claim 5 was rejected as unpatentable over Beauducel in view of Palmer in view

of Scott. Claims 6-7 were rejected as unpatentable over Beauducel in view of admitted prior art. Applicant requests reconsideration.

Regarding claims 1 and 11, Beauducel teaches an analog input, a delta sigma modulator, a communication system having a transmitter, a medium, a receiver, and a data detector for providing a digital output. The invention includes an analog input, a delta sigma modulator, a laser communication system having a laser transmitter, a laser medium, and a laser receiver, as well as a data detector for providing a digital output. A unique aspect of the present invention, as correctly noted by the examination, is the communication of an on and off "binary modulated laser signal" through a laser communication system. The on and off laser communication can be performed at very high switching speeds for bandwidth efficiencies. What is obviously missing from the examination analysis is the reason for the using the binary modulated laser signal.

The examination concedes that Beauducel does not teach a modulated binary laser signal. The examination's suggestion that Beauducel teaches that different types of transmitters could be used, as anything is possible, fails to recite the reasons for the particular type of communications in Beauducel and the differing particular type of communications in the present invention. The examination incorrectly references Palmer as purportedly teaching

1   that a sigma-delta modulator can be used with a laser transmitter.

2   The use of a sigma-delta modulator in Palmer is not related to

3   sigma-delta modulation of an input analog signal, and Palmer is

4   irrelevant in all regards to the present invention, other than to

5   state that sigma-delta modulators are known devices. Palmer teaches

6   that "fractional frequency dividers using sigma delta modulation

7   may be used for the generation of subinterger multiples of the base

8   frequency" for RF communications which certainly does not relate to

9   binary laser communications. (Col 3 line 45, Col 4 line 22)

10

11   The sigma-delta modulator can generate high-speed pulse width

12   modulated signals. By using the high speed on and off laser

13   switching during laser transmitter and receiver communications, the

14   varying modulated pulse widths of the pulse width modulated sigma-

15   delta signal can be communicated and detected upon reception

16   through an on and off laser communication system. It is the

17   combination of sigma-delta pulse width modulated signaling and

18   binary modulated laser communications that enables precise

19   communications of the time varying pulse width modulated sigma-

20   delta signal.

21

22   Beauducel fails to teach using on and off binary modulated

23   laser signal for communicating a pulse width modulated sigma-delta

24   signal. Beauducel appears to be directed towards a slow two-line

25   synchronous multi-level communication system. Rather than

1 communicating a binary signal representing a sigma-delta pulse

2 width modulated signal, Beauducel first encodes the sigma-delta

3 signal into a multi-level coded signal that is time stamped, and

4 then accordingly apparently varies the amplitude of a light

5 emitting diode. Hence, Beuaducel teaches a multi-level encoded

6 sigma-delta signal and multi-level modulated laser signal

7 communications. (Col 3 line 55-62) The intensity switching of a

8 laser diode between various levels is not simple on or off

9 toggling. The purpose of direct binary modulation of the on or off

10 toggling laser signal is to take advantage of the high speed at

11 which lasers can toggle for precisely replicating the varying pulse

12 widths of the pulse width modulated signal. Beauducel teaches just

13 the opposite, by teaching encoded sigma-delta signaling for M-ary

14 multi-level states, with time codes with the use of intensity level

15 modulation. That is, Beauducel encodes the sigma-delta signal with

16 timing clocking information so that the communicated signal is

17 self-clocking, and with reference to a clock, provides for

18 synchronous communications of an M-ary signal. The present

19 invention does not encode the sigma-delta signal with time

20 information, and as such, the communication is inherently and

21 preferably asynchronous in the present invention. Thus, Beauducel

22 uses encoded sigma-delta time-stamped multi-level signal with M-ary

23 intensity modulation for synchronous communications, whereas the

24 present invention uses pulse width modulated sigma-delta signaling

25 with on and off binary laser modulation for asynchronous

-5-

communications. The two signaling methods are directly contrary to each other, and as such, Beauducel is strong evidence of nonobviousness.

The examination concedes that Beauducel, Palmer, and Potratz do not disclose a pulse width modulated signal detector, yet the examination rejects the claims for obviousness based upon conclusionary statements directed to their combined teachings. Yet, none of these cited references teaches direct binary laser modulation of a pulse width sigma-delta signal, as such, the cited references in combination are strong evidence that the examination is engaged in forbidden hindsight reconstruction as all references fail to recognize that pulse width modulation of a sigma-delta modulator, communicated by a high speed binary modulated signal, would allow for high speed communications of an analog input received as a digital signal. Also, Scott's use of a sigma-delta modulator on the received side seems highly irrelevant as well. It is not that isolated elements can be found in the cited references, but rather whether the combined teachings as a whole would suggest the claimed combination. None of the cited references teach the use of a sigma-delta modulator for providing a pulse width modulated signal for communicating an analog input signal as a binary modulated laser signal. Allowance of the claims is requested.